FIG.1

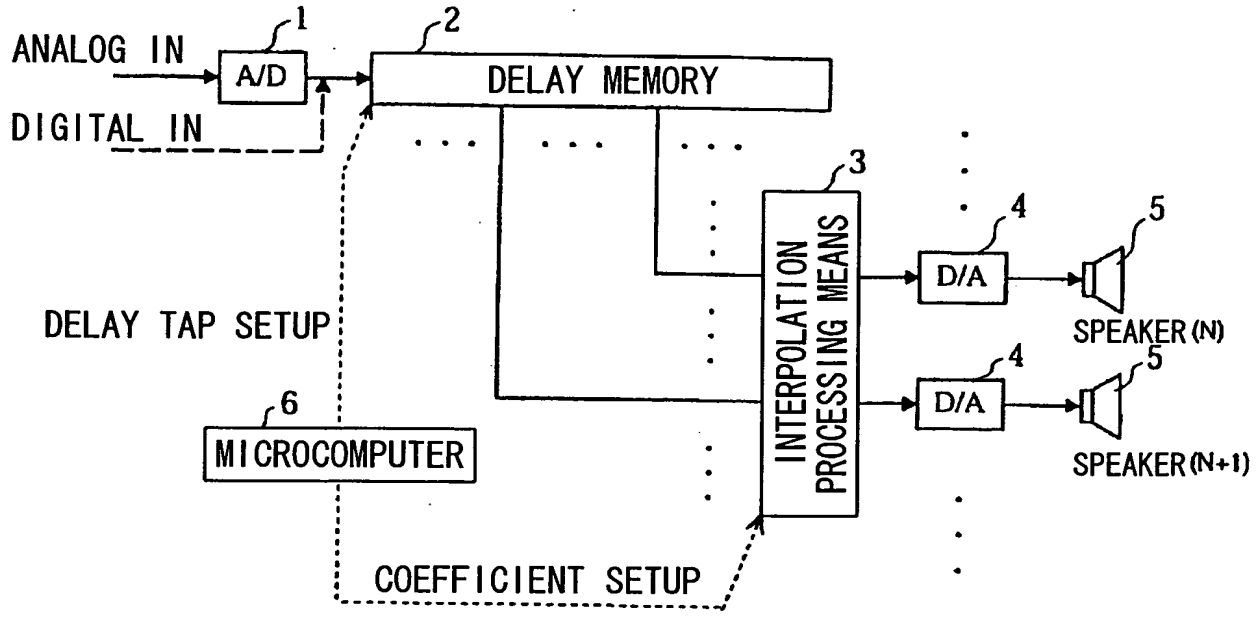

ANALOG IN
DIGITAL IN
A/D
1
2
DELAY MEMORY
3
INTERPOLATION PROCESSING MEANS
4
D/A
5
SPEAKER (N)
D/A
SPEAKER (N+1)
DELAY TAP SETUP
6
MICROCOMPUTER
COEFFICIENT SETUP

FIG.2

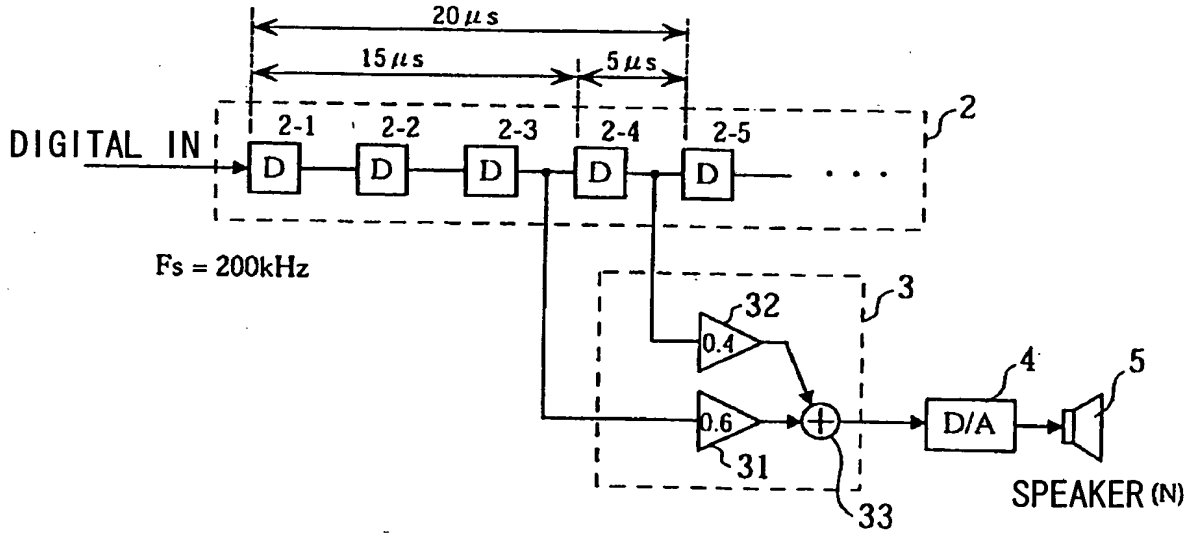

20 μs
15 μs
5 μs
DIGITAL IN
2-1
2-2
2-3
2-4
2-5
D
2
Fs = 200kHz
3
32
0.4
0.6
31
33
4
D/A
5
SPEAKER (N)

FIG.3

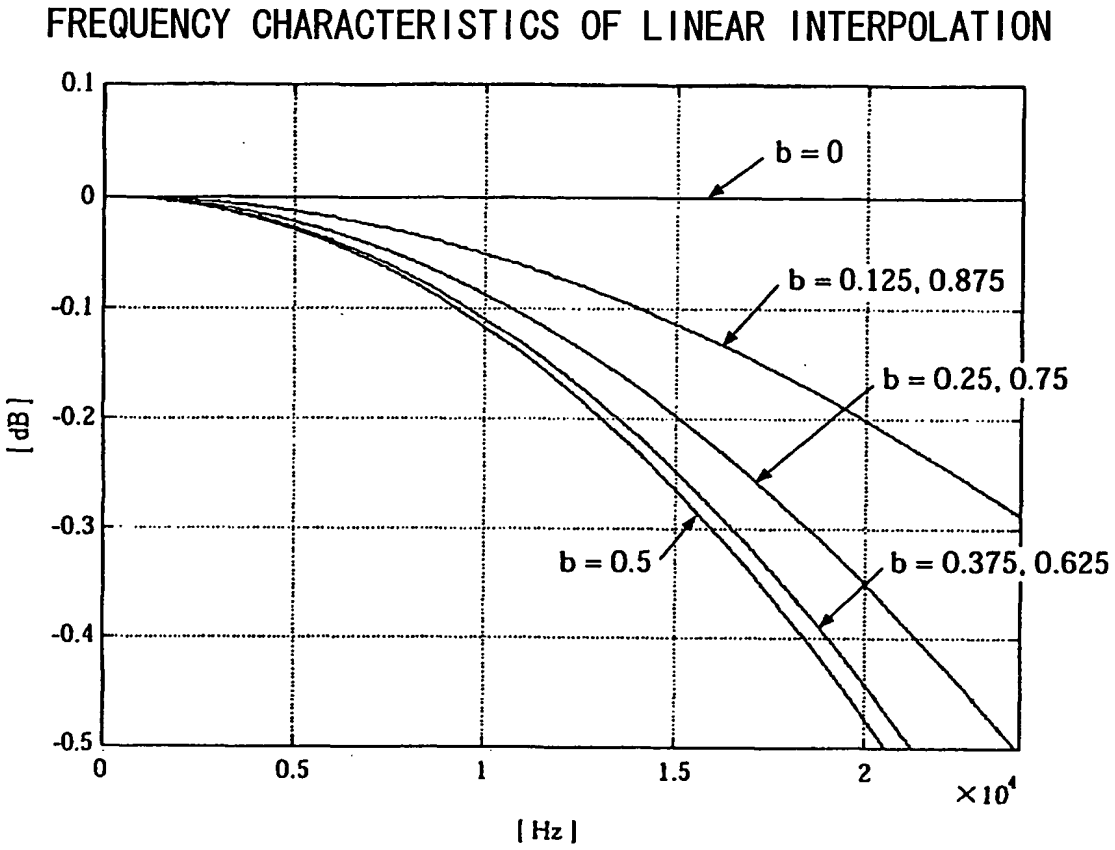
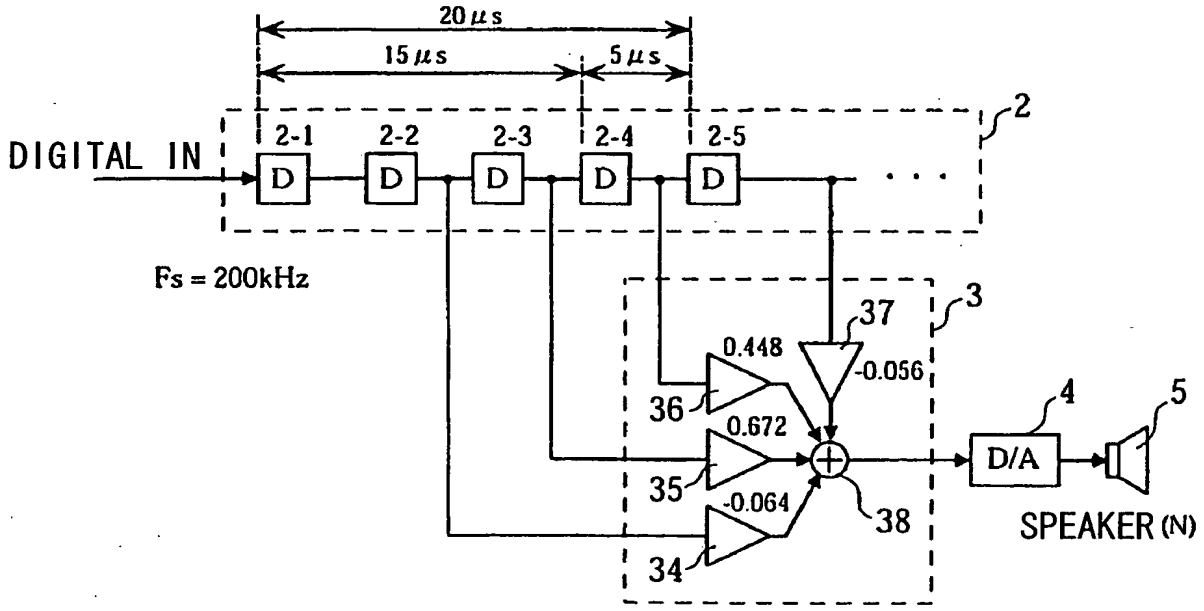

FREQUENCY CHARACTERISTICS OF LINEAR INTERPOLATION
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
[dB]
0
0.5
1
1.5
2
×10⁴
[Hz]
b = 0
b = 0.125, 0.875
b = 0.25, 0.75
b = 0.5
b = 0.375, 0.625

FIG.4


20 μs
15 μs
5 μs
DIGITAL IN
2-1
2-2
2-3
2-4
2-5
D
2
Fs = 200kHz
3
37
0.448
-0.056
36
0.672
35
-0.064
34
38
4
D/A
5
SPEAKER (N)

# FIG.5

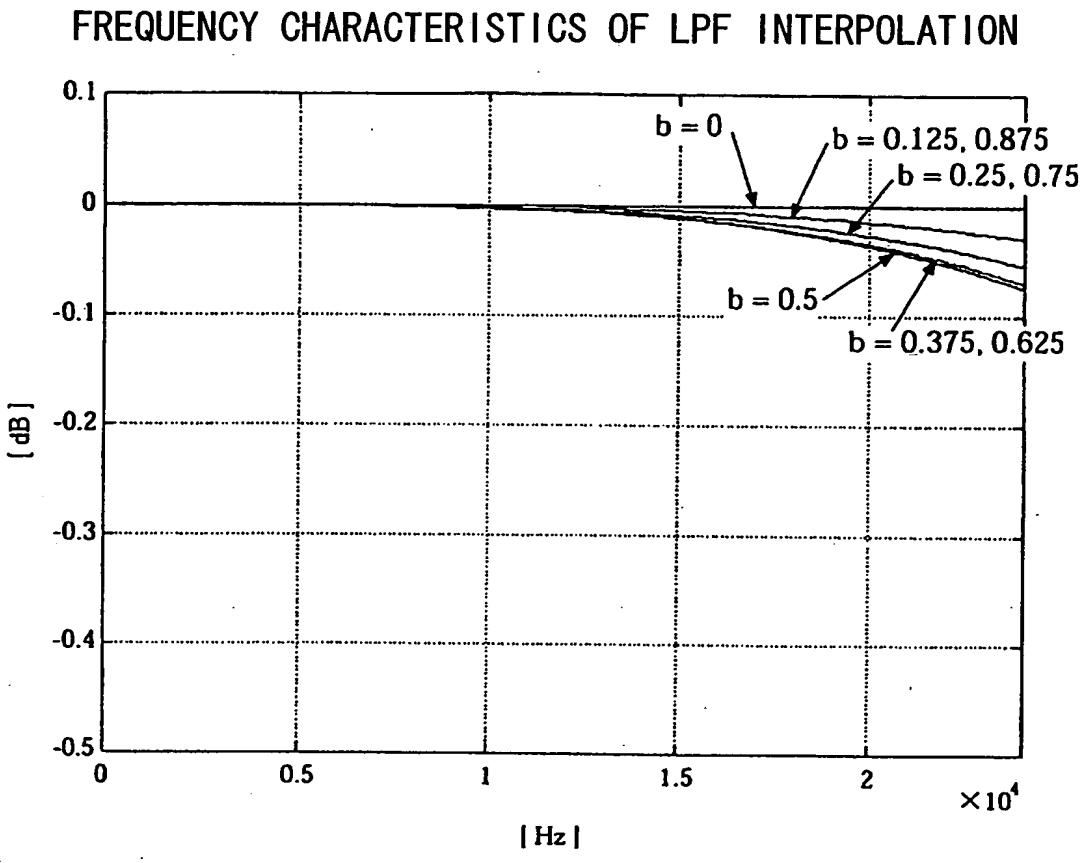

FREQUENCY CHARACTERISTICS OF LPF INTERPOLATION
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
[dB]
0
0.5
1
1.5
2
×10⁴
[Hz]
b = 0
b = 0.125, 0.875
b = 0.25, 0.75
b = 0.5
b = 0.375, 0.625

FIG.6A

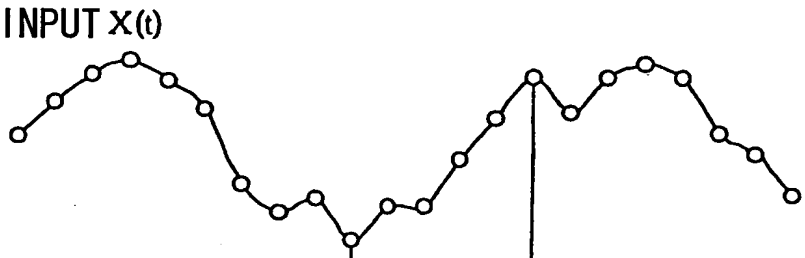



FIG.6B

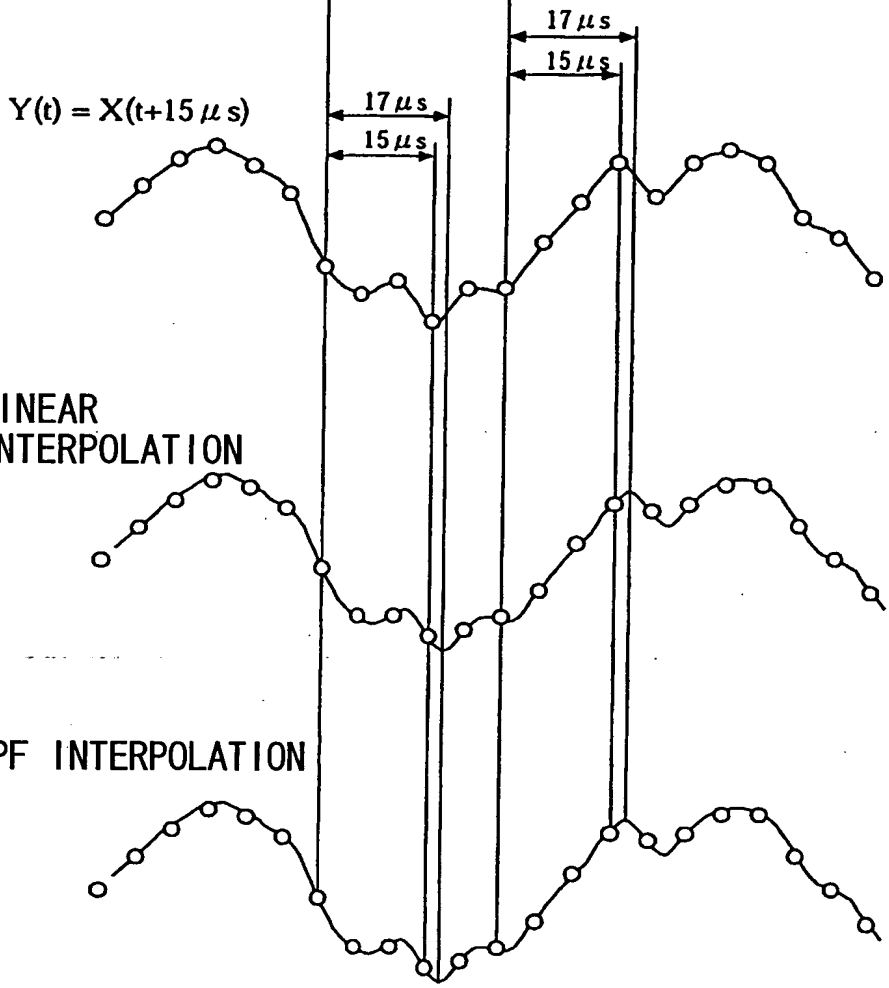



FIG.6C




FIG.6D

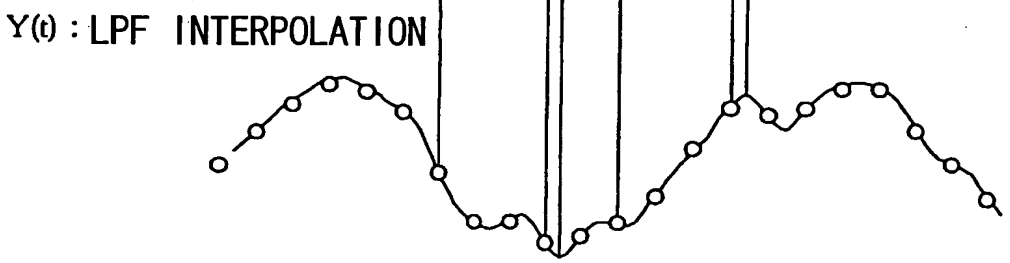


FIG.7

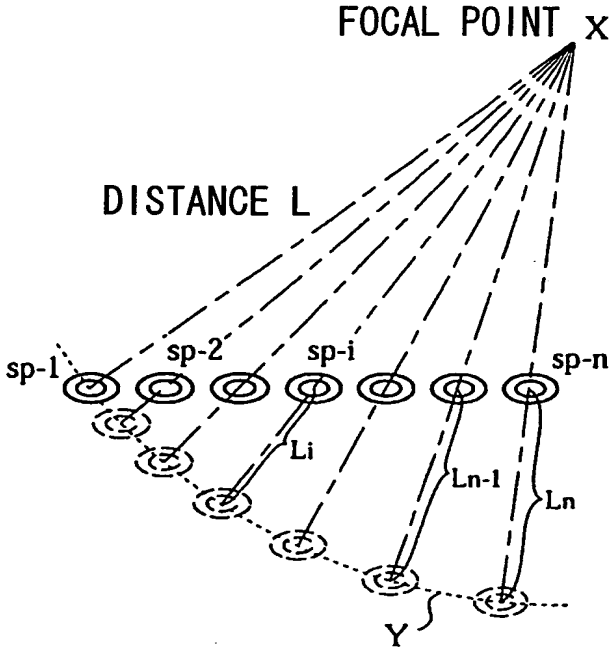

FOCAL POINT x
DISTANCE L
sp-1
sp-2
sp-i
sp-n
Li
Ln-1
Ln
Y

FIG.8

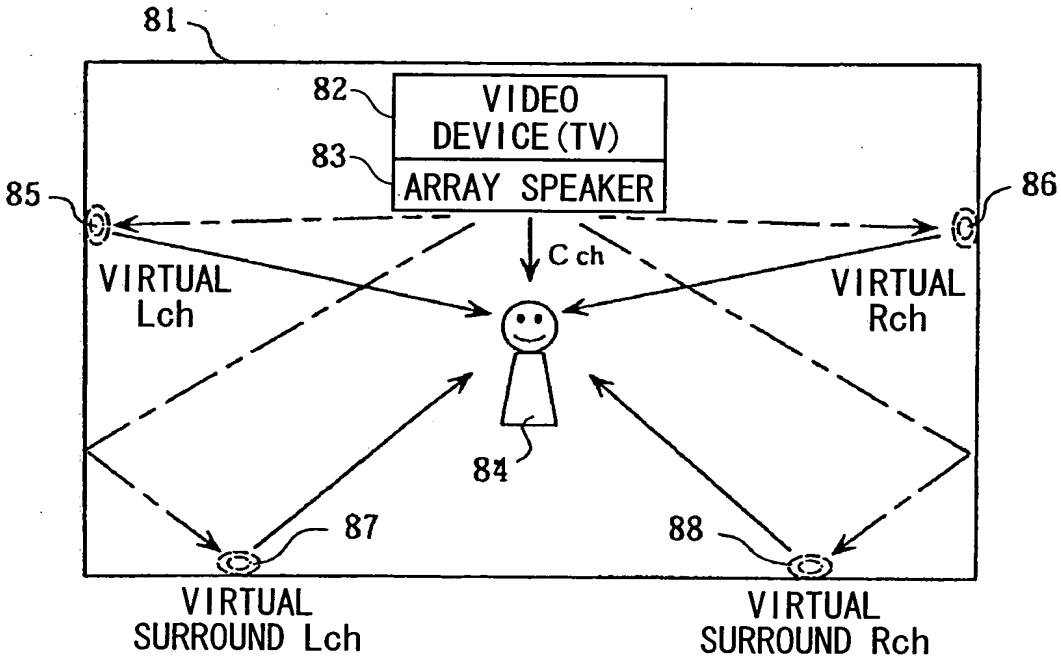
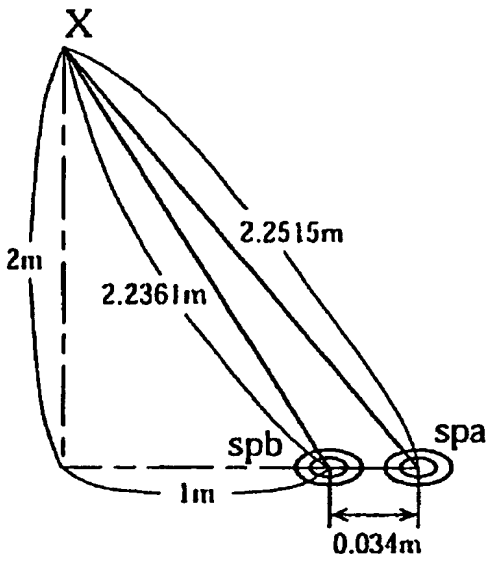
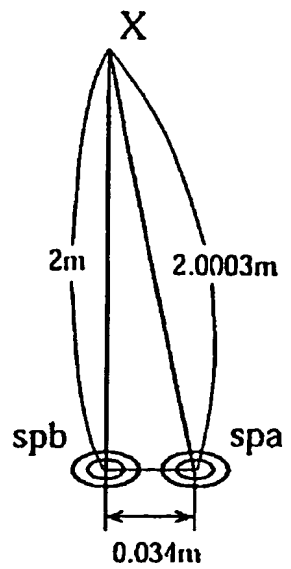

81
82
VIDEO DEVICE (TV)
83
ARRAY SPEAKER
85
86
C ch
VIRTUAL Lch
VIRTUAL Rch
84
87
88
VIRTUAL SURROUND Lch
VIRTUAL SURROUND Rch

FIG.9A




DELAY DIFFERENCE=
0.0154m÷340m/s=45 $\mu$s

FIG.9B




DELAY DIFFERENCE=
0.0003m÷340m/s=0.9 $\mu$

FIG.10

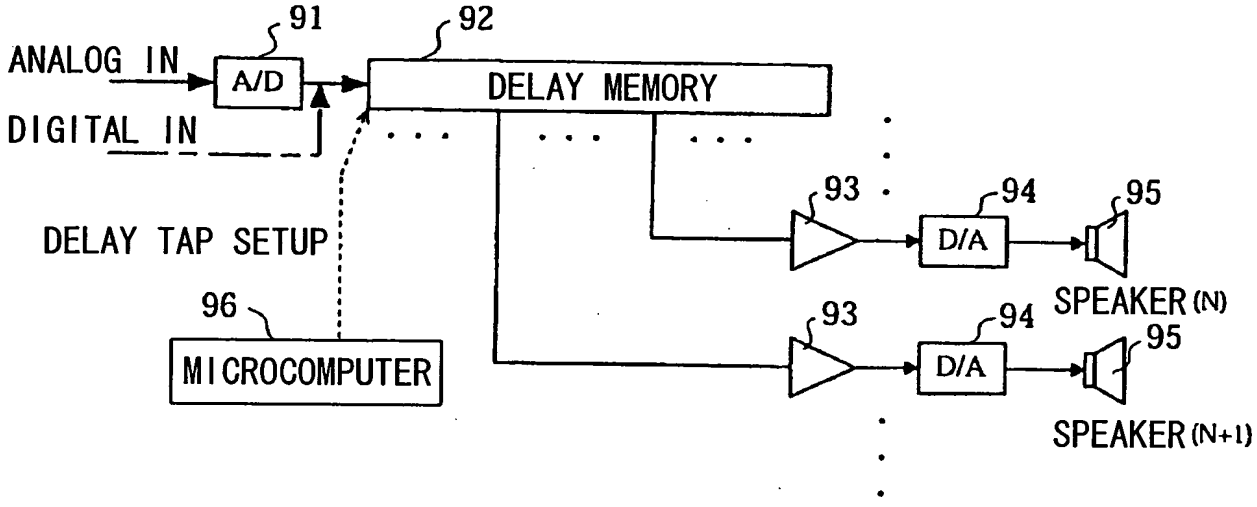
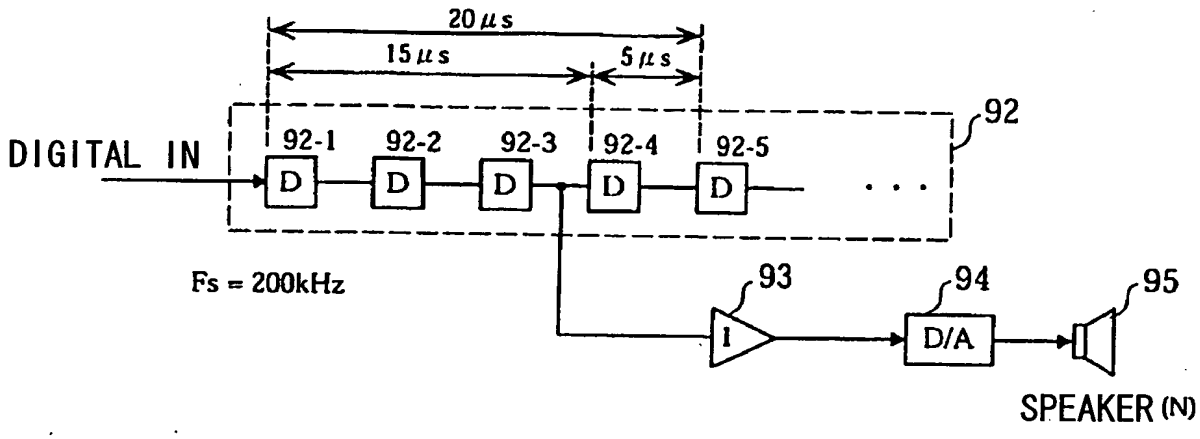


FIG.11


20 μs
15 μs
5 μs
DIGITAL IN
92-1
92-2
92-3
92-4
92-5
92
D
D
D
D
D
Fs = 200kHz
93
94
95
I
D/A
SPEAKER (N)